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REMARKS

Claim Objections

The Examiner objects to the Abstract for referring to the purported merits of the invention.

The Abstract has been amended to delete the merits of the invention, which appear in the last sentence thereof.

Claim Rejections - 35 USC §102

Claims 1-14 are rejected under 35 USC §102(b) as being anticipated by Lee et al. (USPN 6,130,074, hereinafter "Lee").

With regard to claim 1, Applicants respectfully traverse the rejections since the Applicants' claimed combination includes the limitation not disclosed in Lee of:

"a plurality of vias in the dielectric layer..."

Lee discloses a multilayer bonding pad having a top interconnection 960, an intermediate interconnection 940, and a single conductive plug 950. The single conductive plug 950 contains a plurality of square insulators 945I. This is described in Lee column 5, lines 24-36:

> "The upper single bodied conductive plug 950...to thereby electrically connect the uppermost interconnection layer 960 and the top surface of the intermediate interconnection layer 940. At least one upper island insulator 945I having sidewalls surrounded by the single bodied conductive plug... As shown, an array of upper island insulators 945I preferably are provided." [underlining and deletions for clarity]

It is respectfully submitted that a single conductive plug with a plurality of insulators is completely the opposite of and would not anticipate an insulator with a plurality of conductive vias.

With regard to claims 2-14, these dependent claims respectively depend from independent claim 1 or similarly amended independent claim 8, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

Based on the above, claims 1-14 are believed to be allowable under 35 USC §102(b) as not being anticipated by Lee.

Claims 1-14 are rejected under 35 USC §102(e) as being anticipated by Chittipeddi et al. (USPN 6,417,087 B1, hereinafter "Chittipeddi").

With regard to claim 1, the independent claim has been amended to clarify the previously claimed combination to now include the limitation that:

> "a plurality of vias in the dielectric layer and connecting the wide top and wide bottom metal lines including:
> a first via having a width, and
> a second via having a width and spaced more than two widths away and less than four widths away from the first via." [underlining for clarity]

The support for the above amendment is in amended Specification page 3, lines 7-12:

> "Referring now to FIG. 2, therein is shown a cross-sectional view of FIG. 1 along line 2--2 looking up towards the wide top metal line 16 which is embedded in a dielectric layer 22. The via-sea 20 is shown more fully as vias 20a through 20i. The vias 20a through 20i are squares having a width "w" and spaced equal distances "W" apart. The distances that the vias are apart, such as the via 20a from the via 20d, would be such that "W" is slightly larger than two widths "w" and up to four times greater than width "w"." [underlining for clarity]

As held in *In re* Wofensperger, 302 F.2d 950, 133 USPQ 537 (CCPA 1962), drawings alone may provide the basis for subsequent amendments to the specification without producing prohibitory new matter and the support for the above amendment to the Specification is shown in FIG. 2, which shows the spacing to be greater than twice "w". In addition, this limitation appears in claims 2 and 3 specifying a third via spaced more than two widths and less than four widths from the first via. The Abstract has similarly been amended.

Chittipeddi discloses a bonding pad formed by a dual damascene process, which places a barrier layer 14 under the top portion of the bonding pad 17 through which the vias 19 extend. The barrier layer 14 makes the bonding pad 17 resistant to stress effects such as cracking. In Chittipeddi FIG. 3, the vias 19 appear in the columns to be space slightly more than one vias width apart and under one and a half via widths apart, and the rows to be spaced

at about one vias width apart, but Chittipeddi contains no disclosure as to the actual spacing, or any teaching or suggestion that the spacing is relevant in Chittipeddi.

Constant v. Advanced Micro-Devices, Inc., 7 USPQ2d 1057 at 1064 states:

> "A claim is anticipated only if each and every element *as set forth in the claim* is found, either expressly or inherently described, in a single prior art reference. (Kalman v Kimberley Clark Corp., 713 Fed. 2nd 760, 771, 218 USPQ 781, 789 (Fed. Circ. 1983), *Cert. Denied*, 465 U.S. 1026 [224 USPQ 520]), 1984." [emphasis in original]

It is respectfully submitted Chittipeddi no longer anticipates claim 1 because Chittipeddi does not have the claimed "a second via having a width and spaced more than two widths away and less than four widths away from the first via". As shown in the Specification page 3, line 30, through page 4, line 10, this range of widths is unexpectedly critical for reducing the occurrence of via metal explosions. In situations such as this, the C.C.P.A. has held that "ranges which overlap or lie inside ranges disclosed by the prior art may be patentable if the applicant can show criticality in the claimed range by evidence of unexpected results." (*In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (C.C.P.A. 1976) at 100 (citing *In re Malagari*, 499 F.2d 1297, 182 USPQ 549 (C.C.P.A. 1974); *In re Orfeo*, 440 F.2d 439, 169 USPQ 487 (C.C.P.A. 1971)). Chittipeddi does not disclose a range but in any event, the Applicants' claimed range is outside the spacing shown in Chittipeddi FIG. 3.

With regard to claims 2-14, these dependent claims respectively depend from independent claim 1 or similarly amended independent claim 8, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

Based on the above, claims 1-14 are believed to be allowable under 35 USC §102(e) as not being anticipated by Chittipeddi.

Claim Rejections - 35 USC §103

Implicit in any 35 U.S.C. §102 rejection is an obviousness rejection under 35 U.S.C. §103. Applicants respectfully address any such obviousness rejection. Under 35 U.S.C. §103, the scope and content of the prior art are examined to determine whether differences between the prior art and the claims at issue would have been obvious to a person of ordinary skill in the art.

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It is respectfully submitted that no obvious modification of Lee or Chittipeddi would render claims 1-14 obvious because the structures of both Lee and Chittipeddi serve the purpose of providing a bonding pad resistant to stress effects such as cracking. This would not teach or suggest the Applicants' structure for reducing the occurrence of via metal explosions starting from the bottom of the vias and extending upwards towards a top power line.

The other references cited by the Examiner showing the prior art have been considered and are not believed to disclose, teach, or suggest, either singularly or in combination, Applicants' invention as claimed.

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-14 at an early date is solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,

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